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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,049	11/21/2001	William Ford	282662US8X	1484

22850 7590 10/29/2010  
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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NAFF, DAVID M

ART UNIT	PAPER NUMBER
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1657

NOTIFICATION DATE	DELIVERY MODE
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10/29/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 09/990,049	<b>Applicant(s)</b> FORD ET AL.	
	<b>Examiner</b> David M. Naff	<b>Art Unit</b> 1657	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 March 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 25-28, 30-32, 35-43, 45, 47 and 67 is/are pending in the application.
- 4a) Of the above claim(s) 40-42, 47 and 67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25-28, 30-33, 35-39, 43 and 45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been  
5 timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/26/10 has been entered.

An amendment of 3/26/10, amended claims 25, 30, 31, 35-40, and 67, and canceled claims 29,

Claims in the application are 25-28, 30-32, 35-43, 45, 47 and 67.

10 Claims 40-42, 47 and 67 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 5/14/09.

Claims examined on the merits are 25-28, 30-33, 35-39, 43 and 45.

### 15 ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

20 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims  
25 under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 25-28, 30, 31, 33, 35-39, 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompe et al (AR) in view of Singh et al (5,560,960) and Richter et al (AQ).

5        The claims are drawn to a process of producing a platinum metal particle nucleic acid composite containing platinum metal particles by reacting a nucleic acid specific metal complex selected from the group consisting of dichloro (2,2':6',2"-terpyridine)platinum (II), cis-diaminodichloroplatinum (II) and combinations thereof with a nucleic acid to produce a metal complex-nucleic acid conjugate, removing non-conjugated metal complexes and/or non-  
10    conjugated byproducts, and reacting the conjugate with a reducing agent to produce the metal particle nucleic acid composite. The metal complex-nucleic acid conjugate is formed by the specific reacting of the nucleic acid specific metal complex with bases of the nucleic acid, the metal particle-nucleic acid composite is catalytically active towards electroless metallization, the metal particles in the composite are not visualized by atomic force microscopy, and the metal  
15    particles in the composite are sub-nanometer in size. Also claimed is a metal particle-nucleic acid composite resulting from the process.

Pompe et al disclose (page 1090, left col, second full paragraph) that Pt(II) and Pd(II) complexes such as cis-diamminedichloroplatinum attach to DNA bases to form stable monofunctional and bifunctional adducts. Further disclosed (third full paragraph of the left col) is  
20    that the Pt-DNA bond is not broken during reduction, and that Pt(II) and Pd(II) complexes attached to DNA double chain can act as nucleation centers for the growth of metal clusters. Also disclosed is carrying out metallization of DNA by adding DNA to Pd salt solution followed by adding a reducing agent, and obtaining clusters on the DNA of 3 to 5 nm in diameter in a few seconds after adding the reducing agent (paragraph bridging the cols, page 1090). Further

Art Unit: 1657

disclosed is that a wide spread of cluster size distribution occurs reaching from less than 1 nm to more than 20 nm (page 1086, right col, line 8 from the bottom), and obtaining an average size of 1.9 nm (page 1087, left col, lines 1-4).

Singh et al disclose (paragraph bridging cols 1 and 2) precipitating nanometer-sized metal particles from solution within vesicles made from polymerizable phospholipids. Polymerized phospholipids are formed and added to a electroless plating solution. Before the electroless plating solution is added, palladium or platinum is provided on the inside surface of vesicles to function as a catalyst (col 3, lines 44-64). To insure that metal particles form only on the inside surface, any metal on the exterior surface of the vesicle is removed such as by using a chelating agent and gel filtering, or by passing the vesicles through an ion exchange column. Singh et al further disclose (col 5, line 18) using cobalt, nickel or iron when producing metal nanoparticles by electroless plating.

Richter et al disclose (page 508 and 510) metallization of DNA similar to Pompe et al and disclose formation of clusters of 1-5 nm diameter on DNA (page 508, left col, third full paragraph).

It would have been obvious to attach cis-diamminedichloroplatinum to DNA as disclosed by Pompe et al, and then use a reducing agent to obtain DNA containing attached platinum metal catalysis for use in electroless deposition of metal on the DNA as suggested by Singh et al subjecting vesicles containing Pd or Pt to electroless metal deposition and as suggested by Pompe et al carrying out metallization of DNA by treating a DNA solution with a Pd salt solution, and then adding a reducing agent to form metal clusters on the DNA. Removing any non-attached metal complex from the DNA before electroless metallization would have been obvious to prevent the non-attached metal complex from forming metal particles as suggested by Singh et al removing metal from the exterior of vesicles to prevent metal particles from being formed

Art Unit: 1657

on the vesicles exterior surface. The objective of Pompe et al is to obtain metal clusters on the DNA and not at other places, and to accomplish this one would obviously have to remove non-attached metal complex before electroless metallization. Removing any non-conjugated by-products would have been obvious simply to prevent any possible inference with subsequent reactions. It would have been apparent from Richter et al that metal clusters of 1-5 nm diameter can be obtained, and it would have been obvious to produce clusters not thicker than DNA since this is an objective of Pompe et al (page 1090, left col, first full paragraph). Such clusters will not be capable of being visualized by atomic force microscopy. Additionally, Pompe et al disclose cluster sizes varying from less than 1 nm to above sub-nanometer, and an average size of 1.9 nm. This would result in clusters of less than 1 nm in size being present. Reacting DNA with cis-diamminedichloroplatinum as disclosed by Pompe et al followed by reducing as set forth above will inherently result in metallization of bases, and provide a metal nanoparticle active towards electroless metallization. The metallization of Pompe et al and Richter et al is controlled since they disclose controlling the time of metallization to control the size of clusters. The use of cobalt, nickel or iron when producing metal nanoparticles by electroless plating as disclosed by Singh et al would have suggested using a electroless plating solution as in claim 38.

### ***Response to Arguments***

The amendment urges Pompe et al discloses particles of 3-5 nm, which is not sub-nanometer. However, Pompe et al disclose cluster sizes varying from less than 1 nm to above 20 nm, and an average size of 1.9 nm. Therefore, it is clear from Pompe et al that a size less than 1 nm can be produced, and this size is not unobvious. Furthermore, Richter et al disclose clusters of 1-5 nm. Clusters slightly less than 1 nm will function the same as 1 nm clusters, and

Art Unit: 1657

to produce clusters slightly less than 1 nm would have been obvious. Additionally, when producing 1 nm clusters, some will be slightly less than 1 nm.

***Claim Rejections - 35 USC § 103***

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references  
5 as applied to claims 25-28, 30, 31, 33, 35-39, 43 and 45 above, and further in view of Newsman  
et al (5,670,680).

The claim requires a gaseous reducing agent.

Singh et al disclose using hydrogenation (col 4, line 57) for reducing metal ions to  
produce metals in a process of producing metal nanoparticles by electroless plating.

10 Newman et al disclose using hydrogen gas for hydrogenation in producing metal  
complexes.

It would have been obvious to use hydrogen gas as a reducing agent to reduce the metal  
of a conjugate of a metal complex and DNA disclosed by Pompe et al as suggested by Singh et  
al and Newman et al.

15 ***Response to Amendment***

The amendment urges that claim 32 depends from claim 25, and Newman et al do not  
cure the deficiency of the references applied to claim 25. However, as set forth above, the  
references applied to claim 25 are not deficient.

***Double Patenting***

20 The nonstatutory double patenting rejection is based on a judicially created doctrine  
grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or  
improper timewise extension of the “right to exclude” granted by a patent and to prevent  
possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting  
25 rejection is appropriate where the conflicting claims are not identical, but at least one examined  
application claim is not patentably distinct from the reference claim(s) because the examined  
application claim is either anticipated by, or would have been obvious over, the reference  
claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re*  
*Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225  
USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re*

Art Unit: 1657

*Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

5 A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

10 Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 25-28, 30-33, 35-39, 43 and 45 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-32 of U.S. Patent 6,884,587 in view of Pompe et al and Singh et al.

15 The claims of the patent require metallization of nucleic acids with gold to produce a metal nanoparticle-nucleic acid composite.

It would have been obvious to replace the gold of the patent claims used to metalize nucleic acids with platinum suggested by Pompe et al metalizing nucleic acids. It would have been further obvious in view of Singh et al for the type of reasons set forth above to remove non-conjugated metal complexes and/or non-conjugated by-products, if formed, before  
20 treatment with a reducing agent in the process of the patent claims for metallization of DNA. The presence of extraneous metal complex or other by-products will obviously be a contaminant that can interfere with subsequent reactions.

### ***Response to Arguments***

The amendment urges that the patent claims use gold for metallization instead of  
25 platinum as claimed. However, in view of Pompe et al, the use of platinum instead of gold would have been obvious.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

5        If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon P. Weber can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications  
10       may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you  
15       would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David M. Naff/  
Primary Examiner, Art Unit 1657

DMN  
10/25/10